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Exploration between Lake St. John & James Bay 1898.

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REPORT OF PROGRESS
OF
EXPLORATION IN THE COUNTRY
BETWEEN
LAKE ST. JOHN AND JAMES BAY

MADE UNDER INSTRUCTIONS FROM THE
DEPARTMENT OF COLONIZATION
AND MINES, QUEBEC

BY

HENRY O'SULLIVAN, D. L. S. & C. E.

MEM. CAN. SOC. CIVIL ENGINEERS & INSPECTOR OF SURVEYS, P. Q.

PRINTED BY ORDER OF THE LEGISLATURE.



QUEBEC
CHARLES PAGEAU, PRINTER TO HER MOST GRACIOUS MAJESTY THE QUEEN.

1898

Quebec (Province) - Dept. of colonization, and mines

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*To the Honorable A. TURGEON,
Commissioner of Colonization & Mines,
Quebec.*

SIR,

I have the honor to transmit you my report of progress of exploration in the country between Lake St. John and James Bay.

The plan and profiles, to accompany part of the same are now nearly completed, and will be handed to you by the beginning of next week.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed,) HENRY O'SULLIVAN, I. S.
D. & P. L. S. & C. E. Geo. Insp. of Surveys.

Quebec, 9th December 1897.

REPORT
OF
PROGRESS OF EXPLORATION IN THE COUNTRY
BETWEEN
LAKE ST. JOHN AND JAMES BAY.

To the Honorable A. TURGEON,
Minister of Colonization and Mines,
Quebec.

SIR,

In accordance with instructions from your Department, authorizing me to make an exploration of the country between Lake St. John and James Bay, and to examine the shore line and take the necessary measurements and soundings to find the most suitable harbour there, to take notes of the general topography and geology of the country: soil, timber, climate, &c., and to furnish your said Department with a plan, profile, and report of the same showing the obtainable grades and alignment, in view of future railway construction, for the development of that vast region, I have the honour to submit you the following report:

In 1872, my brother, John H. Sullivan and myself, under instructions from the Department of Crown Lands, took the levels from Lake St. John to tide water at Chicoutimi, and found the elevation of said Lake to be 300 feet above mean tide.

Starting with this elevation, 300 feet above datum, sea level, an easy grade of one per cent takes us from Roberval Station, on the Quebec and Lake St. John Railway, over a gently rising swell, that attains an elevation of 250 feet above the Lake, a little south of the division line between the parishes of N.-D. de Roberval and St. Prime, about five miles north of Roberval Village.

Thence northward the land falls to less than a hundred feet above the level of the lake, before reaching St. Prime, but by keeping a little farther west, a lower summit and more uniform grades can be had.

Continuing northward to St. Felicien, and onward along the west or right bank of the River Chamouchouan to beyond the north-western outline of the Township of Dufferin, any desirable grades and alignment may be had with comparatively light earthwork.

Following the river, there are several chutes and rapids, the most important of which is Great Bear chute, shown by photo No. 3.

The total difference of level here, including the rapids and cascades, is 80 feet.

Next comes Little Bear chute, giving a total fall of 42 feet, but there does not appear to be any corresponding depression in the land on either side, in fact, the country seems to be a gradual slope, gently ascending towards the northwest.

The lower *strata*, in the river banks, are generally a good rich greyish blue clay; but are often covered with layers of poor sand from 5 to 10 feet in depth, particularly along the Pemoka or level stretch above the chutes.

Immediately above the north western outline of the Township of Dufferin, begin the long rapids on the Chamouchouan.

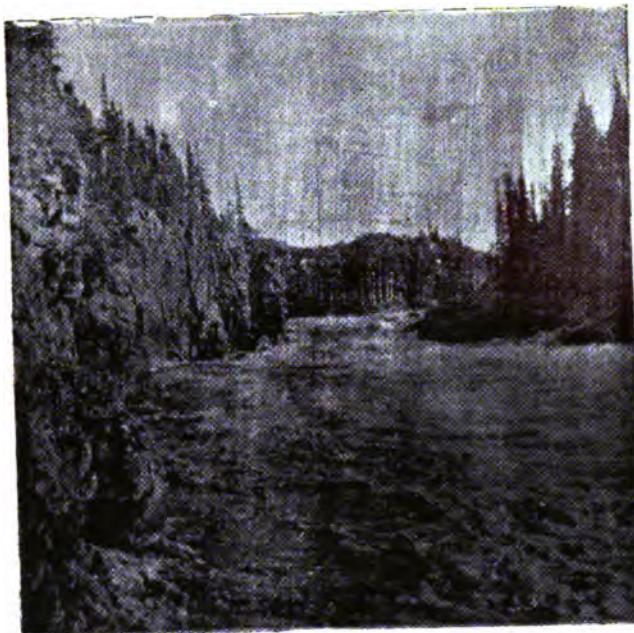
For about six miles here, the river is nearly a continuous rapid, varying from ten to thirty feet per mile fall, and, strange, it keeps its general width of five or six hundred feet right along, and spreads evenly over its well paved boulder bottom.

The only smooth water in a distance of six miles, that is, from the foot of the long rapids to the mouth of the Big Stony Creek, or "Rivière du Cran," is a short stretch of about a thousand feet at the mouth of the Little Stony, or Otter brook.

This part of the line would be rather expensive, for the road bed would have to be cut out of the solid rocky side hills, that rise, in some places, from the water's edge at an angle of 40°.

Although there is no unsurmountable obstacle here, and easy grades and good alignment can be had, still perhaps an easier line may be had, by following the valley of either the Salmon and Doré, or the Poplar river, which run nearly parallel to the main river, on the west side. This will be referred to again further on.

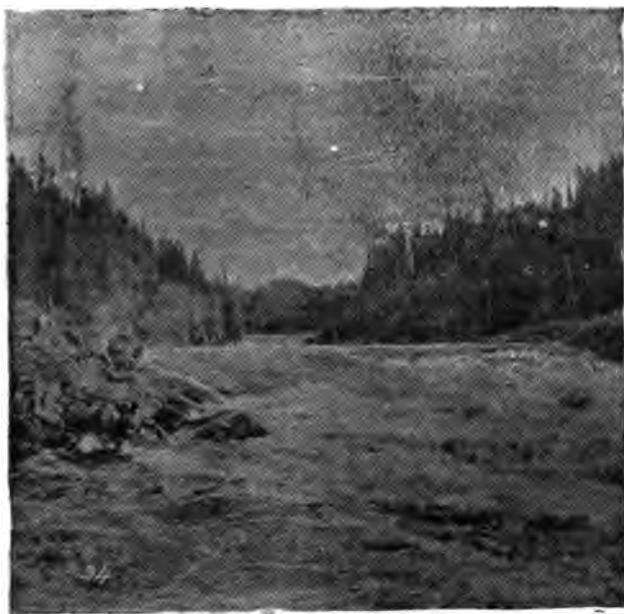
From the Big Stony River, up to the Chaudière falls, a distance of about 13 miles, the river Chamouchouan runs in a nearly straight line, between bold side hills on either side, but there is generally room for a good road bed all along.



UPPER STURGEON FALLS
(Nottoway Waters)



FALLS ON RUPERT RIVER



LOWER STURGEON FALLS
(Nottoway Waters)



FALLS ON THE RUPERT

The Hat Rapids, White Spruce Rapids and Hawk Rapids, with some other small rapids and currents, in this stretch, give 100 feet difference of level, or about 8 feet to the mile.

Hawk mountain, on the north east side, about three miles below the Chaudière falls, shown by Photo No. 5, rises 500 feet above the level of the river. Opposite there, on the south-west side, we must begin to, rise on the easy side-hills, to overcome the sudden elevation of the Chaudière falls, which give a total rise of 110 feet to the level stretch, at the mouth of the River Chigobiche, where the elevation is 810 feet above sea level, as shown by the accompanying plan and profile.

We examined the main river Chamouchouan, from there up to the Nikaubau, but found its course so tortuous, and the country, on either side so uninviting, that we abandoned it, in favor of the valley of the River Chigobiche, which offers a much easier and shorter route to the same point, viz: the Junction of the Nikaubau and Chamouchouan Rivers, as shown on the plan,

I took photos of all the chutes and cascades, &c, and fished in all the waters.

We caught some splendid ouananiche at the foot of the Chaudière falls, but above that point they do not ascend.

There are some splendid fishing pools on the Chigobiche River, swarming with pike, doré, pickerel, &c, but no speckled trout or ouananiche are found there.

Lake Chigobiche is a magnificent sheet of water, about twenty miles in length, and varying from one to two miles in width. Its elevation is 1106 feet above sea level.

We followed its west shore for about thirteen miles and thence crossed over by an easy portage about a mile in length to a small river, that winds through a low valley, and empties into the south end of Lake Chamouchouan, as shown on plan.

Looking southward from Lake Chigobiche, a chain of mountains seems to run in a south easterly direction, and the Indians say that a level route can be had along their base, right down to Roberval; at all events, I think that the valley of the Salmon and Doré Rivers might be reached in that direction, which would shorten the route, and avoid the rock cuttings on the Chamouchouan River.

Lake Chamouchouan is another fine sheet of water, about ten miles in length and from half a mile to a mile and a half in width. Its elevation is about the same as that of Lake Chigobiche, 1106 feet above sea level.

From here, we explored two different routes towards the height of land; one by a fair sized river and chain of lakes bearing west from Lake Chamouchouan, and the other by the Nikaubau, and crossed the watershed at three

different points. The elevation of the summit, on the most southern route, is 1240 feet, the central summit, 1280 feet, and the most northerly summit, 1300 feet above sea level.

The distance in a direct line from Lake Chigobiche to the most northerly summit is about 45 miles, and the difference in level is less than a hundred feet, and beyond the watershed, there is very little difference of level for several miles in the direction of James Bay.

The distance along the height of land between our most northern and southern summits is about 15 miles.

Therefore, the Height of Land or summit between the St. Lawrence and James Bay waters, in this region, may be more properly called a vast elevated gently rolling plain : there are no high mountains or deep valleys, the different waters interlock, and I venture to say that some of the lakes may discharge both ways during spring freshets.

The country between Lake Chamouchouan and the height of land is a sandy loam, well wooded with black and grey spruce, tamarac, bouleau, &c, from 8 to 16 inches in diameter, a vast improvement on the country between there and the surveyed townships of the Lake St. John basin, which is mostly all second growth, since the conflagration of 1870.

Unless that the climate of that elevated region should prove unfavorable, there is a great extent of land fit for settlement in the environs of Lake Chamouchouan, and between there and the height of land.

I never saw such an abundance of gooseberries and currants as along the rivers here ; the currants were remarkably large, clear skinned, and most delicious in flavor, superior to any garden currants I ever tasted ; they were fully ripe about the beginning of August.

The moment we begin to descend the opposite slope, both soil, timber and climatic indications visibly improve.

The geological formation along the Chamouchouan river, and over the height of land, is gneiss and granite, but about ten miles beyond the watershed, we strike the Huronian rocks, and thence onward, we generally find rich clay soil with alternate outcroppings of sedimentary rock gneiss, granite and syenite.

We passed through several large and beautiful lakes unknown to geography on the nameless river we followed from the height of land down to its junction with the discharge of Lake Chibougamou. These will be more fully described in a subsequent report as soon as my plans and profiles of that section are completed.

One of these lakes is about thirty-two miles in length, with many winding bays and beautiful islands.

Its shore line measures over 200 miles, and is generally well timbered with large white and black spruce, tamarac, poplar and bouléan, &c.

Some of the spruce here is over two feet in diameter, and from seventy-five to ninety feet in height.

Near its north-eastern end a large river comes in from the south-east. The Indians go by this river to the Hudson Bay Company's posts, on the River St. Maurice, and they say that there are more rapids and falls on it than on the river we descended, which would show that the land is higher in that direction.

My Indian guides say that spring opens far earlier here than in the region of Lakes Ascatsie and Chamouchouan, that the ice is generally off early in May, and that they are often delayed by ice a week or a fortnight later on the latter lakes on their way out with their furs to Lake St. John.

I took astrohysical observations at different points on this lake, and find that it lies between latitudes $49^{\circ} 12'$ and $49^{\circ} 32'$ North, and longitudes $75^{\circ} 04'$ and $75^{\circ} 33'$ West. Its elevation is 974 feet above sea level.

There are no speckled trout in these waters, but they are well stocked with sturgeon, pike, pickerel, whitefish, grey trout, &c. I saw a large sturgeon rise near our canoe, that would certainly have weighed over a hundred pounds.

From the confluence of these waters with those of the Chiboutigamou, a broad majestic river flows with swift current and a few slight rapids down to Waswanipi, falling 66 feet in about 30 miles.

The distance from the height of land to Waswanipi by our canoe route is about 150 miles, and the difference of elevation from the lowest summit above mentioned is 325 feet : the country is level or gently undulating, very few mountains can be seen in any direction, and the fall is pretty evenly divided over the entire distance ; therefore any desirable grades and alignment can be had for railway construction throughout this section.

Arriving at Waswanipi, I was informed, by Mr. David Baxter, the gentleman in charge of the Hudson Bay Company's post there, that no harbour could be had at the mouth of the Nottaway River : that, possibly, one might be found at the mouth of the Rupert River, or in Hannah Bay, but that the mouth of the Nottaway was choked up with islands and sand bars.

This made me alter my course, for certainly if no port could be found at the mouth of the Nottaway, and that one could be had in Hannah Bay, the line should cross the river at Waswanipi, and strike directly for the mouth of Hannah river.

All the Indians who knew the route by the Nottaway had gone to their winter hunting grounds, and the few that remained there only knew the way by a chain of lakes northward to the Rupert.

The main object of the expedition, as far as the practicability of constructing a railway from Lake St. John, over the height of land to Waswanipi, was successfully ascertained, and before any line from there to the seaboard could be chosen, some point on James Bay where, according to my instructions "vessels of sufficient draught for the navigation of Hudson's Bay could enter" should be decided on.

Any way, the season was too late for me to attempt reaching James Bay with men who did not know the route by the Nottaway, in time to take any soundings or measurements there, and reach home before winter set in, and the information I had obtained from the Geological Department, regarding the country from Waswanipi to James Bay, via the Nottaway River, satisfied me that no serious obstruction was likely to be met with in that direction.

I therefore sent back some of my Lake St. John men, in charge of one of my assistants, to complete the topography of the route we had followed, and I engaged new hands at Waswanipi, who knew the route from there to Rupert House.

Mr. and Mrs. Baxter were exceedingly kind to us and rendered us every service they possibly could.

I was pleased to see the interest that gentleman has taken in farming: it is not often that you find a Hudson Bay Company's man doing much in that line. Certainly, the man who chose the site of the post had not that object in view.

I told Mr. Baxter that if the Railway passed there, he would likely find his house taken away by a steam shovel some fine morning, for it is built on the finest gravel-pit I ever saw, and the whole knoll shown in photos Nos 41 and 46 is of the same material.

Still it is surprising to see the fine vegetables and grains he has grown there. I never saw better cabbage, carrots and turnips, and he gave me samples of wheat which he had grown from seed raised there the year before, and other wheat which he had grown from seed obtained from the agricultural farm at Ottawa. They are equally good, and can compare favorably with wheat grown in any other part of the province.

The surrounding country is all level, rich clay land and Mr. Baxter is clearing up a piece of ground not far off that will certainly give still better results.

I left him a thermometer and he kindly agreed to keep a daily record of the temperature, and rain and snow fall and send me the result by the winter packet.

Myself and assistants had a swim in Lake Waswanipi, on the 9th September, and found the water warmer than we found that of Lake Chigobiche, in the middle of August.



WASWANIPY POST, FROM HAY LANDING, HUDSON BAY CO.



WASWANIPY POST AND MOUND, HUDSON BAY CO.



OUINANICHE FISHING NORTH OF LAKE ST. JOHN.



CHUTE GRAS, RIVER CHIGOECHUE.

36
T. PER
INRAY
TA

HAY
BUSHES NORTH SHORE

C. DARTEAU, PHOTO-CRAYON, QUEBEC



MR. O'SULLIVAN SWIMMING IN HUDSON BAY, OCTOBER 3RD, 1897.



MR. & MRS. GORDON IN THEIR GARDEN AT RUPERT HOUSE.



HALF-WOLF, HALF-ESQUIMAULT DOGS AT RUPERT HOUSE.



HUDSON BAY CO'S ESTABLISHMENT. RUPERT HOUSE.



HUDSON BAY CO'S SCHOONER "MINK" IN WINTER QUARTERS
AT MOOSE FACTORY.

The country from Waswanipi to Rupert House will be fully described in a subsequent report as soon as my plans and profiles of that section are completed.

I transmit you, in the mean-time, some photographic views I took along the route, which will show that there is no scarcity of water power in that region.

JAMES BAY :

The Hudson Bay Company's post, called Rupert House, situated on a rising ground, on the left or south bank of the Rupert River, about a mile east of the general shore line of the Bay, commands an excellent view of a great portion of the broad bay and surrounding country.

This is the principal depot, from which the eastern and south-eastern interior posts are supplied. It is situated about midway between the head of tide water, and the open bay, and the Hudson Bay Company's schooner, called the "Mink", shown by Photo No. 77, which to use the Commandant, Captain Taylor's own words "She can go around the world" can enter here at all stages of the tide.

Photo No. 69, which I took from the top of a haystack east of the post, will give you an idea of the extent of the establishment: and Photo No. 70, showing Mr. and Mrs. Gordon in their garden, taken on the 29th of September, will show that the climate there is not so inhospitable as it is sometimes represented to be.

I began by measuring the cross-section of the river bed, opposite the Company's store, and took the levels from extreme high water to low water mark, as shown by the accompanying profile.

The sectional area of flowing water at low tide, was 15,600 feet, and the velocity, 200 feet per minute, which, with due allowance for friction, gives a flow of at least 3,000,000 cubic feet per minute.

I found, by a mean of two observations, one of the sun at his meridian passage, and one of polaris at upper transit, that the latitude of Rupert House is $51^{\circ} 29' 25''$ North.

The manager of the establishment, Mr. D. McTavish, was absent, but his assistant, Mr. Gordon and his good wife, received us most kindly. Good roasted wild geese, stock-ducks, wavies, snipe and plover, with mealy potatoes, cabbage, and other vegetables, washed down by a good pitcher of Bass's brown ale, go well, when one comes out of the woods.

Mr. Gordon provided us with a large four fathom canoe, and men who were well acquainted with the Bay from Rupert House to Moose Factory, and on the 29th September, we began taking soundings and sketching in the shore line from the Rupert to the mouth of the Nottaway River.

As we proceeded with the work, it became evident that a better plan than any that has yet been made of the shore line, should be constructed to admit of placing the soundings in their proper position.

This required more time than I could possibly devote, without running the risk of being frozen in there for the winter; for although the environs of the bay never freeze until well on in November, the chains of lakes that must be crossed, near the height of land on every canoe route between there and the outskirts of civilization on the St. Lawrence waters, are never safe to rely on crossing with canoes after the 15th of October.

I therefore confined myself to making a rapid sketch of the coast to the mouth of the Nottaway, to the taking of certain soundings there, and fixing astronomical points to control the work, and left my assistants to complete the measurements and soundings necessary to construct a correct and reliable plan of the same.

While at the mouth of the Nottaway, I measured the cross-section of the river above high tide, as shown by the accompanying profile, and found that the discharge of that immense river is about four million (4,000,000) cubic feet per minute at ordinary low water.

I found the latitude at the head of tide, in the Nottaway, to be 51° 10' 00" North; and about a mile below, or north-west of this point, I found 28 feet of water within ten chains of the right or easterly shore.

There is no doubt that a good harbor can be had here for any sized vessels ever likely to navigate the Hudson Bay waters, but the channel from thence to deep water in the Bay, may require a certain amount of dredging, the extent of which, owing to the lateness of the season, I could not take time to ascertain, but it can be given in a subsequent report, as soon as the necessary measurements and soundings are taken.

On my way to Moose Factory, I examined the coast line all along, and took astronomical observations, and some odd soundings at different points on the way.

At Point Comfort, the most northern point of the tongue that separates Rupert Bay from Hannah Bay, I found the latitude 51° 39' 32" North.

We were delayed here by the wind, on the 3rd of October, and I enjoyed a refreshing bath in the salt water, which, I must say, was not colder than I have often felt it at Tadoussac, Rimouski, and Ste. Anne des Monts, in midsummer.

We entered Hannah Bay at high tide: but before we could cross it, the tide was gone; and we could see nothing but sand bars for miles all around: and at the mouth of the Moose River, we were stuck on sand bars about seven miles out from shore.

I believe that the Province of Quebec holds the key to the navigation of

those vast northern waters, for from what I have seen, I am confident that no port can be found at Hannah Bay or Moose Factory, and the most experienced navigators say that no safe port can be found on the western side, south of the mouth of the Churchill River.

The excellent level clay land that borders the southern part of James Bay, from beyond the Rupert River, westward to Moose Factory, and for 200 miles still westward, along the Moose and Missannabie River: the countless numbers of wild fowl, geese, ducks, snipe, plover, &c., seen on the way, with many other interesting notes on the bay and its surroundings would be too lengthy to describe with justice, in this report.

The levels were carefully and continuously worked out from Lake St. John to James Bay, and they agreed surprisingly well with those I had taken via the Ottawa Valley, and over the height of land to Waswanipi, in 1894: see Commissioner's Report, 1895.

Barometrical and thermometrical readings were daily taken, and I gave my assistants, whom I left at Rupert Bay, particular instructions to continue those observations, and to take note of every thing that might be of interest to the Department, the amount of rain, hail or snow fall, winds, tides, fish, game, &c.

The lowest thermometer reading we had on the whole expedition was $31\frac{1}{2}$ ° above zero Fahrenheit up to the 9th of October, when the thermometer fell to 27 ° above zero at Moose Factory.

When this cold dip set in, I left there in a hurry, for I had still about 340 miles of rivers, lakes and portages to cover before reaching Missanabie Station, the nearest point on the Canadian Pacific Railway to Moose Factory; but the weather soon became mild again, and we reached the railway in fourteen days.

About 40 miles above Moose Factory, we passed through splendid beds of gypsum.

I regretted being unable to remain longer at Moose, as much for the kind treatment I received there, as for the interesting information they were ready to impart on every side. The Right Reverend Dr. Newnham, resident Bishop, Mr. Broughton, the Hudson Bay Company's head factor, and Captain Taylor, who has been navigating Hudson and James Bay for the last thirty years, gave me every information they could, and did every thing in their power to make my sojourn there as pleasant and agreeable as possible. I was pleased to see the interest the Lord Bishop has taken in farming and gardening.

Here is a list of some of his garden stuff, which the Right Reverend gentleman gave me in his own hand writing, with full liberty to use it as I pleased:

“ Splendid celery, tomatoes, vegetable marrows 15 to 40 lbs. each, ~~salad~~,

kohl rabi, carrots, parsnips, turnips, beets, peas, beans, all kinds of cabbage, cauliflower, rhubarb, red and black currants, lettuces, radishes, herbs : all a good size; some not to be beat anywhere."

In the foregoing pages, I spoke of the spruce, and other indigenous trees met with after crossing the height of land ; in a subsequent report, more details will be given of the general topography, fish, game, &c., as soon as my returns are completed.

In the virgin forest, spruce, fir, tamarac, and cyprès, or Banksian pine are the chief conifers, while the deciduous trees are limited to poplar of different varieties ; white birch, willow, alder, hazel, pembina and similar undergrowth, with occasionally black ash along the river and lake shores.

I saw no white pine, and although the cyprès or Banksian pine is decidedly a native of that region, it is only in the dry burnt districts, and on the poorer heights in the neighbourhood of Lake Nemiskau, on the Rupert river, that it was seen in abundance, in fact, pine of any kind seldom flourishes on such rich clay soil as is found in the basin of the Nottaway.

There is an abundance of spruce and tamarac, wherever the country has not been burnt, but the larch fly is rapidly destroying the latter timber, and more so towards the height of land than in the vicinity of James Bay.

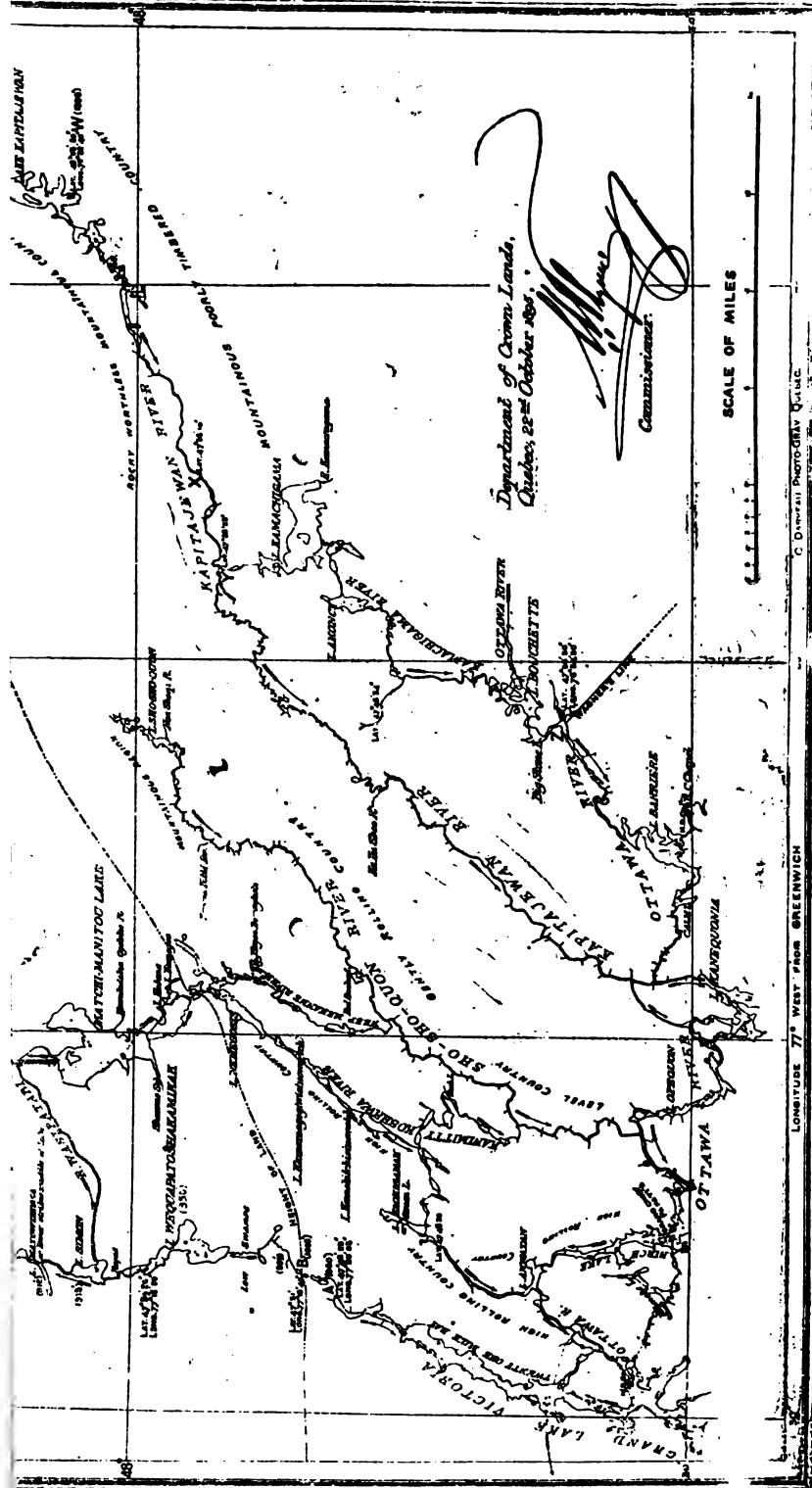
Here and there, areas, more or less extensive, have been swept by fire, from 25 to 50 years ago, and are now well grown up with poplar, white birch, spruce, tamarac and cyprès of fair size according to age, insuring an abundance of pulp wood for ages to come and bring down Pulp is the industry of the coming age, black spruce is the king of woods for pulp making, and this country is the home of the black spruce.

We have a big country to develop, and our knowledge of it is very limited.

Up to 1894 the resources of all that region bounded on the north by the Rupert River, on the south by the height of Land dividing the St. Lawrence from the James Bay waters, and on the west by the province of Ontario embracing an area of some 50,000 square miles was practically unknown.

Mr. John Bignell on the part of the Quebec government and Messrs. Richardson, Cochrane and McOuat on the part of the geological society penetrated a certain distance here and there beyond the watershed, but not far enough to throw any light on what the country was like.

In 1894, under instructions from the department of Crown Lands, I crossed the watershed from Grand Lake on the Ottawa and penetrated the opposite slope to beyond Waswanipi, and made known the existance of the mighty rivers that drain the country there and flow by the Nottaway into Rupert Bay. See map of said exploration with accompanying outline map from Commissioners report of 1895, transmitted herewith.



The year after (1895) Dr Bell of the Geological Department, following the same route, completed the survey of the Nottoway down to its mouth, and with Mr. Brock as assistant explored some of its branches and connecting canoe routes in 1896 ; but of the 67,000,000 acres additional area recognized as belonging to the province I am safe in saying that more than half of it has never been seen by white man, if I except perhaps some Hudson Bay Company's, courreurs de bois, in search of furs.

Messrs Galbraith, Low and Eaton, have done considerable work on the Rupert and East main rivers, and in other parts between there and Hamilton Inlet, but the unexplored area is yet far in excess of what has been explored.

Mr. A. P. Low says, on page 56 L of his very interesting report on the Labrador peninsula, dated Ottawa, 1896 : "Very little is known officially or otherwise concerning the fisheries of that great inland sea, Hudson's Bay, and a great amount of wealth may be lying dormant in its waters for lack of knowledge concerning its fisheries."

Mr. G. F. Baillargé, late Assistant-Commissioner of Public Works, at Ottawa, and his brother, Mr. Charles Baillargé, our indefatigable Quebec City Engineer, have given a good deal of attention to this subject, and have each put in pamphlet form about all the information available concerning the bay and its environs. We find therein, among other things, that according to the United States Commissioners of Fisheries for 1875-76, their whalers made at least 50 trips to Hudson Bay, bringing home cargoes worth \$1,371,000.00, or of an average value of \$27,240.00 per trip per vessel, during the eleven years prior to 1874. As many as 200 white whales have been killed at one tide at Port Nelson, which, if valued at only \$100 each, give \$20,000.00, a nice figure for one day's catch.

It takes these whalers two years for one cargo, for they are unable to pass in and out of the Hudson straits and make their catch in the same year. While if we had railway communication, with whalers at Rupert Bay we could have two cargoes the spring and fall catch for each vessel every year.

Lignite exists in the valley of the Moose River, and anthracite has been found on an island, on the east coast of Hudson Bay, and geologists say that coal may be found on the islands of James Bay.

From the great number of unworn limestone flags and boulders, containing very distinct fossils, I believe that some of the shoals or low islands in the bay must be limestone beds, and that portions of the same are yearly detached by frost and are dropped here and there along shore by the melting ice.

Nearly all the metals are found in the Huronian formation bordering on the Laurentian, and although I did not find anything of sufficiently remarkable importance to attract public attention in this hour of Klondyke fever, I have no doubt that a more thorough examination of the country I passed through, between the height of land and James Bay, will result in the discovery of minerals of economic value. In some places magnetic iron is sufficiently

abundant to turn the compass needle nearly end for end. See Report of Commissioner of Crown Lands for 1895, page 104.

The shore line of James and Hudson Bay following the east coast from the mouth of the Nottaway, the most southern point of the bay, to Cape Westerholme, the southern entrance to Hudson Straits, measures, in a nearly due north line, 800 miles, about the same distance as the former point is north of the city of Washington, and the western shore line measured in the same way, exclusive of bays and inlets, from the mouth of the Nottaway to Rowles Welcome is about 1609 miles, and the area embraced between these limits amounts to upwards of 350,000 square miles.

It must be remembered that although the Hudson Straits are packed with ice, and are impracticable to navigate during nine months of the year, and I may say commercially, impracticable at any season, the bay itself, within the limits above described, is always open for navigation from June until November.

James Bay is generally open early in May.

Notwithstanding the different reports to the contrary, there is no great irregularity in the tides in Rupert Bay.

The difference between high and low water mark at neap tide is 7 feet, and at spring tides about 15 feet.

At Moose Factory, the wind has a wonderful effect on the tide. The day I arrived there, it was blowing a strong south-west gale, and we did not perceive any rise at all during the time of high tide, but the following day the wind changed to north, and during high tide the water rose some ten or twelve feet.

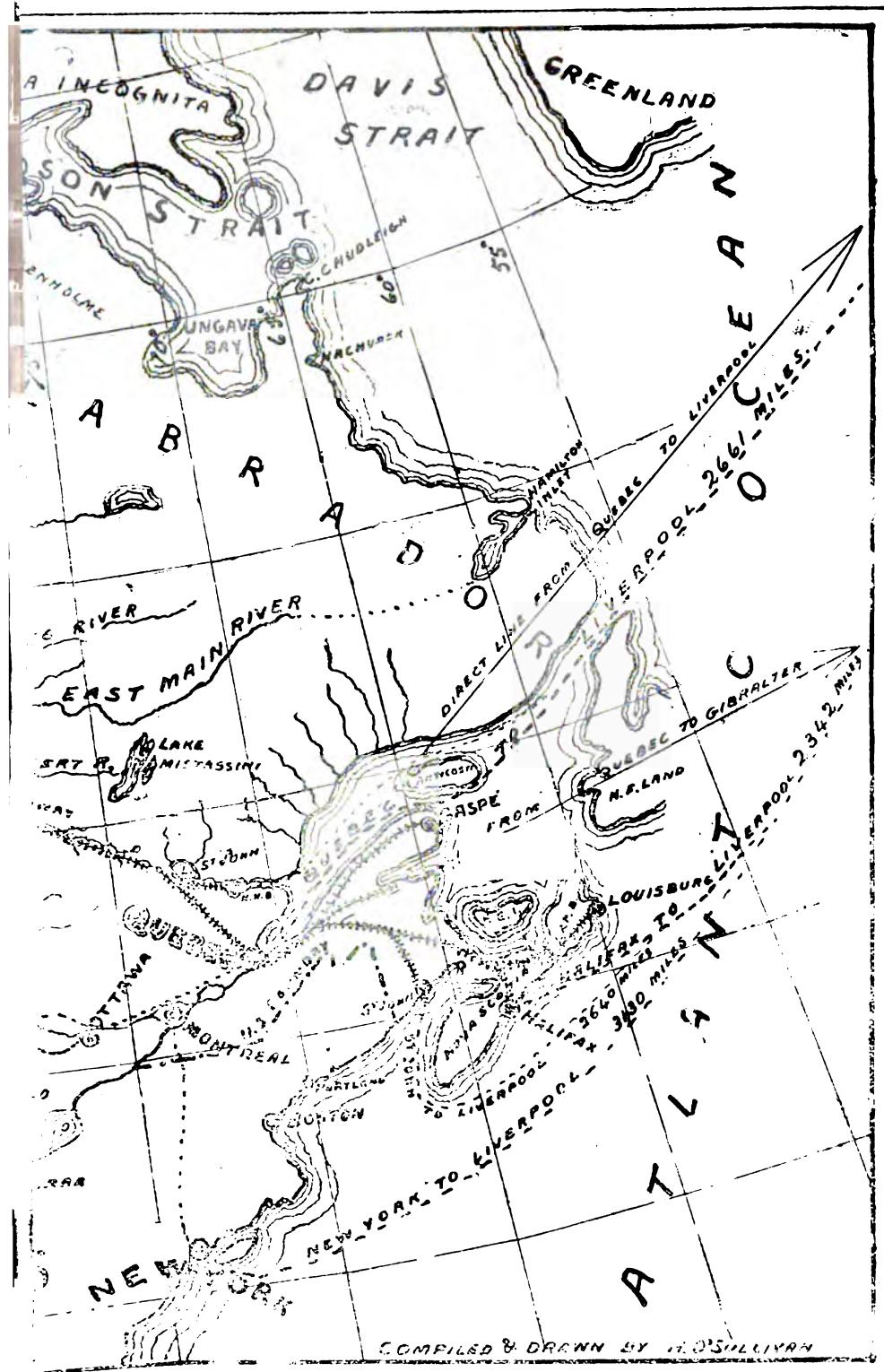
This must be owing to the immense sand bars that extend for several miles seaward at the mouth of the Moose river and all along the western shore of the bay.

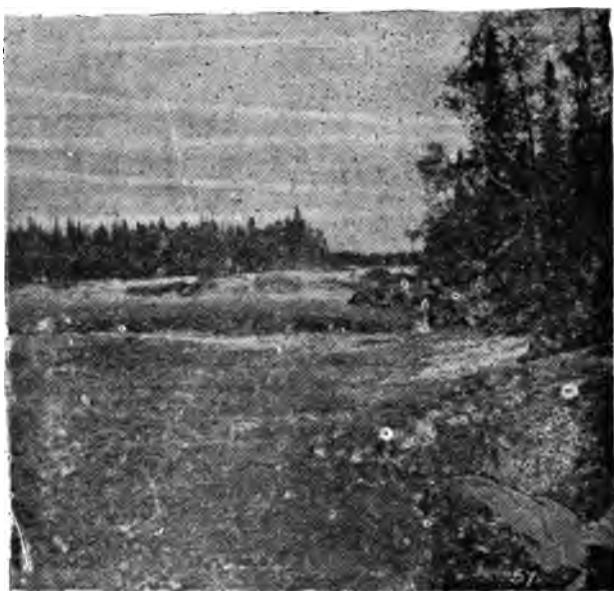
I believe that the wind must have the same effect in Hannah Bay, for the mouth of the river is divided into two separate channels by a large island, and these channels wind crookedly through the sand bars and muddy flats that extend seaward as far as the eye can reach.

I do not think, however, that the wind has much effect on the tide where the water is sufficiently deep: for the days I spent in Rupert Bay, it blew pretty hard from different points of the compass, and I did not perceive any difference in the tides worth mentioning.

Herewith, you will please find a map which is a photographic reduction of one I made on a large scale to accompany my lecture on Northern Canada, and though roughly made, every point of any importance is shown thereon in its true geographical position. (See the "Bulletin of the Geographical Society of Quebec, for 1897"). It shows the doubly advantageous position of the mouth of the Nottaway, to control the future trade of that immense region.

All the large rivers, the Albany, Moose, Hannah, Nottaway, Rupert, East-





LOWER JUMPING FALLS



CATCHING WHITE FISH AT LOWER FALLS ON RUPERT RIVER

Main and Big River converge here, and the forest wealth of the thousands of miles, drained by these mighty streams, and others of lesser note, can be concentrated at either the mouth of the Nottaway or Rupert Rivers.

This alone, with the great area of good clay land, fit for settlement on either side of the line should be sufficient inducement to secure the construction of the railway.

I know that the country is worthy of development, and that it can be more advantageously developed by the continuation of the Quebec and Lake St. John Railway, which line would pass through the centre of the most valuable part of the newly acquired territory, while the others would, at most, only touch its western extremity.

Until adequate railway communication is had there, the vast resources of all the territory north of the height of land will remain dormant and of little or no practical utility to the Province: and any well directed expenditure made by the Province for its development would incalculably enhance its credit.

No doubt if a Railway were built along the route I followed, the numerous water powers that are found at convenient intervals, some of which are shown by the accompanying Photos, would soon become sites of industry, and at the same time, centres of colonization.

I am afraid, however, that the Quebec and Lake St. John Railway Company is at present unable to carry out so huge an undertaking, as the construction of some 380 miles of railway through an unbroken forest without very substantial aid from both the Provincial and Dominion Governments, and the enlistment of foreign capital.

To enlist this foreign capital, it must be shown that it is a safe and solid investment; and for that reason, I ask liberty to add a few remarks, which, I trust, will show that the project in question is not merely one of local or provincial interest, but that it is inseparably connected with other interests of the highest national importance.

Many projects have been on foot to reach James and Hudson Bay by rail, to secure the traffic of that vast inland sea, even to the amphibious idea of reaching the Klondyke via Missanabi, Moose Factory and Chesterfield Inlets; but the projected line from Lake St. John to the mouth of the Nottaway has beyond all this the unmistakable prospect of becoming at some, perhaps, not too far distant date, part of the shortest, safest and most economical, all year round, transcontinental route between Europe and the Oriental empires.

This projected transcontinental line, as shown on the plan, would cross the Nottaway at the head of tide water, where the whole river is contracted to a width of 1450 feet from bank to bank, and the central or longest span need not exceed 500 feet, as shown by the accompanying profile.

Thence, a direct line to Norway House, at the foot of Lake Winnipeg, would pass through the gypsum beds on Moose River and give access to a vast area of rich agricultural land in the northern part of the Province of Ontario.

Hannah Bay does not extend so far south-east as is shown on our plans of that region.

This straight line continued would strike about the forks of the Peace and Smoky rivers, which point is considered to be about the centre of the fertile northwest wheat growing region, and thence follow the valleys of the Peace and Skeena rivers to the Pacific Ocean, crossing the Rocky Mountains, where the summit is two thousand feet lower than that of the Canadian Pacific Railway.

The resources of the Peace and McKenzie River basins were examined by a select committee of the Senate of Canada, and a report of the same was published by the authority of the Dominion Parliament, in 1888.

According to said report, there is a possible area of 656,000 square miles along the McKenzie river, suitable for the growth of potatoes, 407,000 square miles suitable for the growth of barley, and 316,000 square miles suitable for the growth of wheat; that there is a pastoral area of 860,000 square miles, 26,000 miles of which is open prairie with occasional groves, the remainder being more or less wooded, and that 274,000 square miles including the prairie may be considered as arable land; that the difference of latitude makes no corresponding difference in the climate: flowers bloom as early in spring and as late in autumn, at Great Slave Lake as at Winnipeg, or St. Paul and Minneapolis: the prevailing southwest, or Chinook winds render the climate along the Peace and Liard Rivers as mild and salubrious as that of Western Ontario.

Wheat ripens along the McKenzie river under the Arctic circle, a thousand miles farther north than Rupert House.

With this vast area open for settlement, it is needless to say that the shortest and best route thence to the European markets must prevail.

The Husdon Straits, as already stated, are commercially impracticable. The defective working of the compass, owing to its proximity to the magnetic pole, which, according to Gauss, is in latitude $73^{\circ} 35'$ North, and longitude $95^{\circ} 39'$ West, the frequent fogs and mists that leave the mariner with only the sounding line to depend on, to battle with the flowing ice and ice-bergs of Davis Straits that block the entrance between Cape Chudleigh and Resolution Island, in July, and sometimes, in August, and the fields of sheer black sheet ice, ten or more feet in thickness, that sweep down through Fox Channel and block the other entrance to the Straits at Digges Island in September, render the navigation here unsafe and uninsurable.

See Lieutenant Gordon's reports published by the Dominion Government, in 1884-85-86.

For similar reasons, no all year-round available port can be had on the Labrador coast, and therefore, the shortest available route is via Quebec.

Via Ha ! Ha ! Bay and the Saguenay, would be shorter, but the ice remains too long there in spring, and owing to the difficulty of getting return cargoes there, trading vessels might often have to go one way empty.

These arguments have been very unjustly used against Quebec, but every spring, the Ocean steamers can load at the Quebec wharves, and cross over to Liverpool before the ice is off the Saguenay river, or off the St. Lawrence River, between Quebec and Montreal, and in the autumn, these rivers are always closed in November, while there is seldom anything to hinder the largest ships in the world to ply between Quebec and the open ocean until Christmas. It is well known that when the ice takes early at the Chaudière, our port is always clear the rest of the winter, and a bridge with good abutments at the narrowest part there would, I believe, secure this result every year.

It is not unusual for ships to be detained a week, or a fortnight at the Quebec wharves, waiting for the ice to move off of Lake St. Peter. They might be here a month earlier, if they wanted to come.

As regards return traffic, when ears have to be freighted to or from any place west of Montreal, the difference of 170 or 180 miles on such level lines as the North Shore or Grand Trunk Railways, cannot be considered a serious obstacle to reach a port where the fleets of the world can ride in safety.

Nature destined Quebec to be the emporium of trade between Europe and North America; even from San Francisco, the distance is shorter to any European port via Quebec, than by any port on the United States coast.

It is useless to work against nature. The more we denude the forests and the more we dredge and sweep the channel the more the water will evaporate, and the sooner will it flow off; and the diversion of a good portion of our waters at Chicago will certainly not improve the shipping facilities on the St. Lawrence above tidal water.

We have had examples enough last summer to open the eyes of the general public.

Nature has provided every thing for Quebec: A deep water shore line, with very little interruption on either side of the river from the Louise Basin to Cap Rouge, a distance of nine miles: and if more room is required, a canal may be made along the St. Charles valley, giving wharfage room on both sides, right up to Cap Rouge, at moderate cost. This canal might be fed by

the Des-Mares, St. Charles, Ancienne-Lorette and Cap Rouge rivers, making Quebec, once more, an island, as it certainly must have been in ages gone by.

The Jacques-Cartier, the St. Charles and Montmorency, on the north, and the Etchemin and Chaudière rivers, on the south, can furnish unlimited electric power, &c., which, in this age of lightning and steam, is a necessary adjunct to a growing city.

Frontenac, on arriving in Canada, wrote home as follows :

“ Rien ne m'a paru si beau et si magnifique que la situation de la ville de Québec, qui ne pourrait pas être mieux postée, quand elle devrait devenir un jour la Capitale d'un grand empire.”

Which translated reads thus :

“ I have never seen anything so fair or so grand as the site of Quebec.
“ That city could not have been better placed, had it been purposely intended
“ to become the Capital of a great empire.”

The more we study the geography of our country, the more strikingly true do we find the above prophetic words.

The question may however be asked that since Quebec has such natural advantages, why is her trade languishing, why are her wharves idle, in a word why is she at a stand still ?

To this I would answer, that had our own representatives been true to their trust, had our capitalists been endowed with the same spirit of enterprise as those of our sister city, and had our people possessed a better knowledge of the geography of our country, Quebec, the cradle of the Dominion, would still be the Commercial Metropolis.

It is the only port on the Atlantic slope that can rival New-York.

It is as close as the latter city is to St. Paul and Minneapolis, 300 miles nearer to Winnipeg the centre of North America, and 469 miles nearer to Liverpool.

With a bridge at Quebec, the winter traffic could continue on to the Canadian seaports, via the Intercolonial, or still better by the proposed route that would leave the Intercolonial at St. Charles, and run directly by the valleys of the Rivers du Sud, Noire and St. John to Edmunston, and thence, via the Ristigouche, to any point on Baie-des-Chaleurs, that may be chosen in connection with the now strongly advocated Galway route.

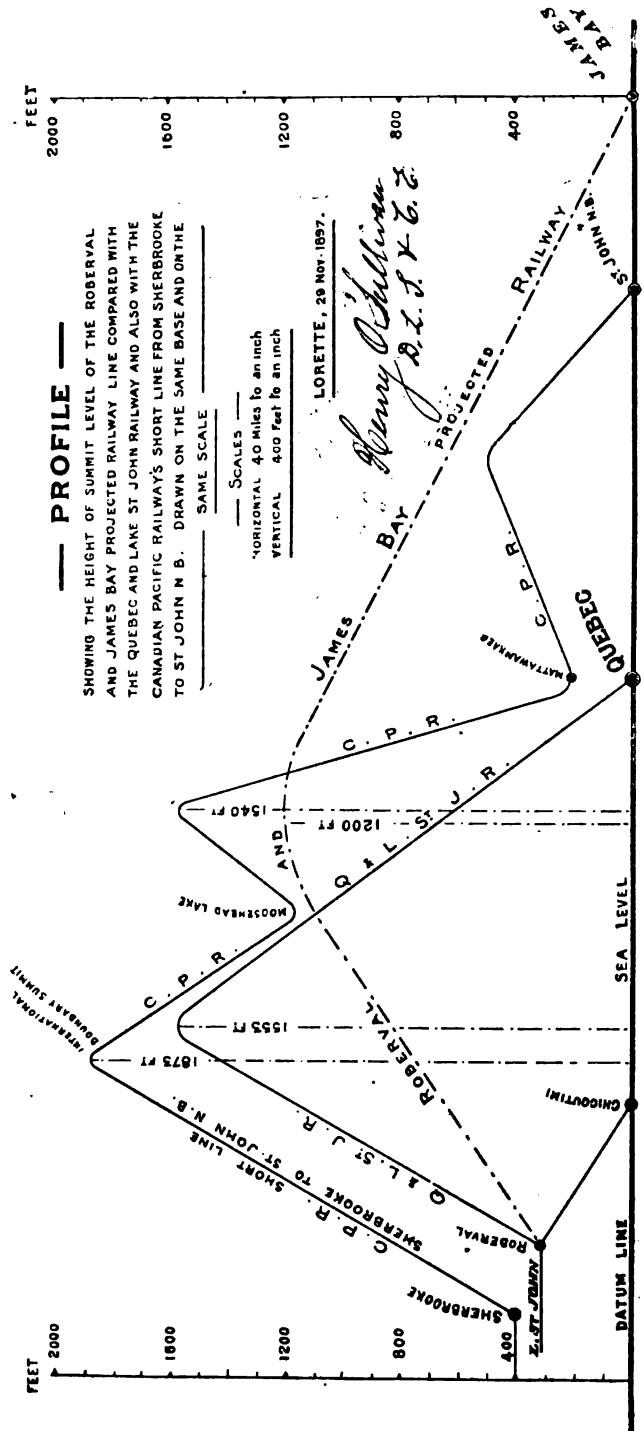
The line from Edmunston to Moncton has been already surveyed, which together, with the direct line from Quebec and the North Shore Railway, would make the distance from Montreal to Moncton 150 miles shorter than via

— PROFILE —

SHOWING THE HEIGHT OF SUMMIT LEVEL OF THE ROBERVAL
AND JAMES BAY PROJECTED RAILWAY LINE COMPARED WITH
THE QUEBEC AND LAKE ST JOHN RAILWAY AND ALSO WITH THE
CANADIAN PACIFIC RAILWAY'S SHORT LINE FROM SHERBROOKE
TO ST JOHN N.B. DRAWN ON THE SAME BASE AND ON THE
SAME SCALE

— SCALES —
HORIZONTAL 40 Miles to an inch
VERTICAL 400 Feet to an inch

LORETTE, 29 Nov. 1897.



C. D. H. PHOTOGRAPHIC CO. LTD.

the Intercolonial, and some 40 or 50 miles shorter than by the so called short line via Sherbrooke and Mattawamkeag.

The accompanying profile shows the grades of the said so called short line, compared with those of the projected line to James Bay.—See Sessional Papers of the Province of Quebec. No. 29, vol. 19-3 of 1886.

Of course, if the much talked of blocking of the straits of Belleisle were ever carried out, the St. Lawrence would be, no doubt, navigable to Quebec all the year round.

This is no idle dream: it is only a question of money.

The building of a dike or dam nine or ten miles in length, with an average depth of 200 feet, where the most suitable material for the same can be had on the spot, is not a very stupendous undertaking where three nations are concerned.

If the combined interests of Great Britain, the United States and Canada were fully weighed, the money would soon be available, for the cost would be trifling, compared with the material benefits to be derived therefrom.

As water must come to its level, so must the main current of through transcontinental traffic, sooner or later, follow this proposed line from Quebec to James Bay, and thence, to the mouth of the Skeena via the Peace River Valley.

This northern crossing of the Rockies was strongly recommended by Marcus Smith and other engineers of high standing at the time of the construction of the C. P. R'y.

The whole line will lie from three to four hundred miles north of the C. P. Railway, assuring a more uniform temperature for the transport of the cereals and other products of the West: it has 2,000 feet lower summit, easier grades, and better alignment, it will develop a world of territory now inaccessible, and besides being so far from the frontier, it will form a safe Military line, in a word, a back-bone to the country, in case of hostilities; and with all this, it will bring the distance from Great Britain to China and Japan, to be about 600 miles shorter than by any other practicable route.

I know I will be criticised for this apparent digression, and some may think my ideas rather extravagant; but it must be remembered that modern engineering has rendered quite practicable now many projects that would have been considered absurdities some years ago.

I was young, but I remember the time when the promoter of the Union Pacific Railway, in the American Congress, was asked by another very important member if he was in his sober senses, and if so, why should he try to impose

on the Government the extravagant and impracticable idea of building a railway across the Rocky Mountains ?

The Union Pacific Railway has been built, and five other railways besides it, in the United States, across the Rocky Mountains, and we have built one in Canada : therefore, I have every reason to believe that before long, we will build another one.

The whole humbly submitted.

I have the honor to be,

Sir,

Your most obedient servant,

(Signed)

HENRY O'SULLIVAN, D. L. S. & C. E.

Member Can. Soc. Civil Engineers,

Inspector of Surveys, P. Q.

Lorette, 29th November 1897.

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